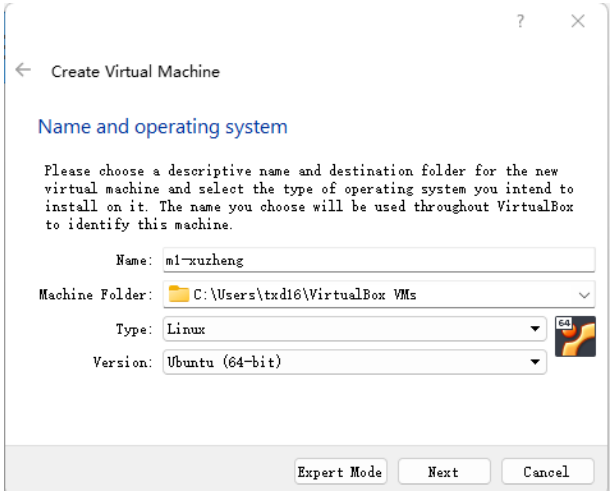
Práctica 1 SWAP

XuSheng Zheng

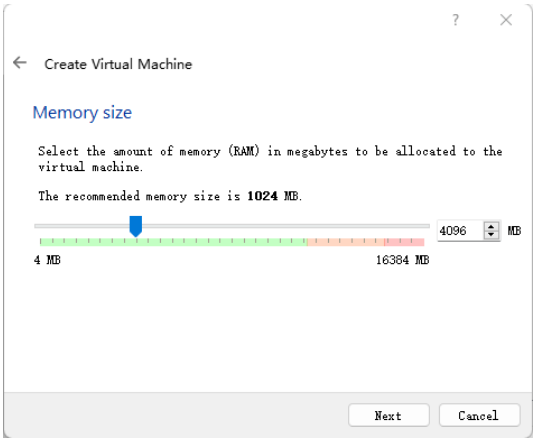
Índice

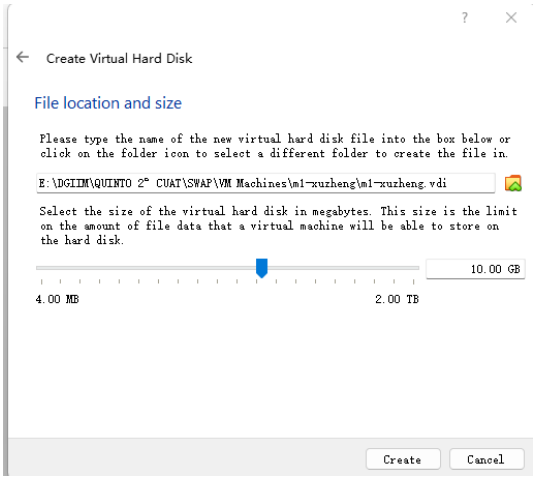
1. Instalación de máquinas virtuales

Comenzamos con la instalación de las máquinas virtuales. Puesto que vamos a hacer lo mismo en ambas máquinas, vamos a centrarnos en la configuración de una de ellas:

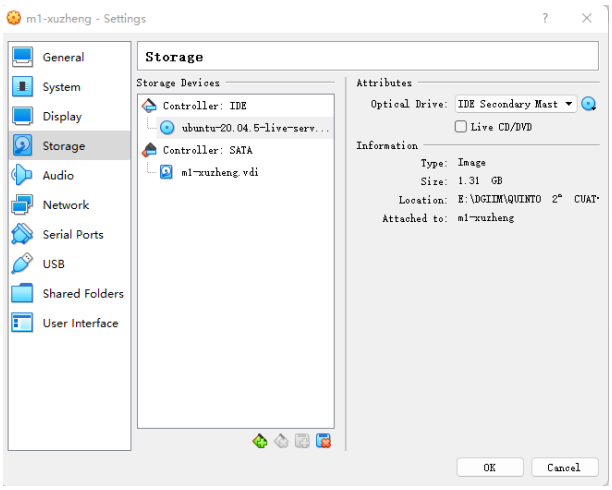


Le damos 4GB de RAM y 10 GB de disco duro:

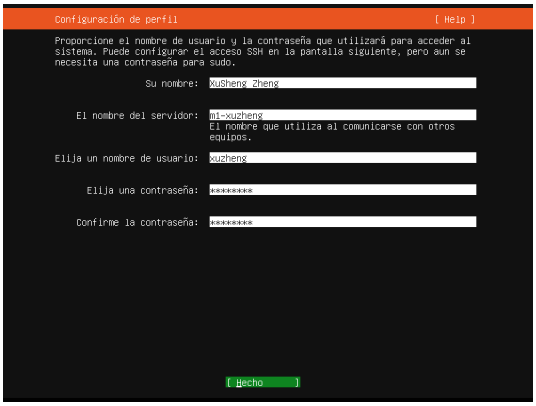


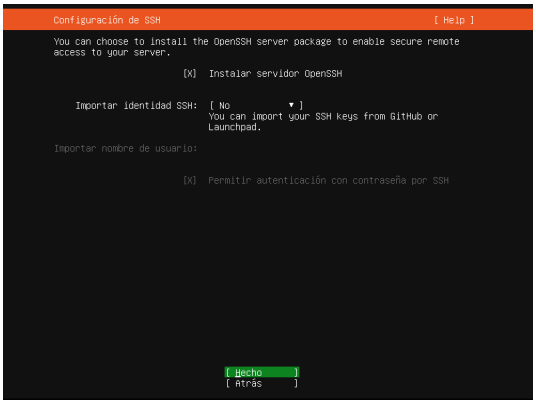


Vamos a instalar Ubuntu Server, en este caso, será la 20.04:



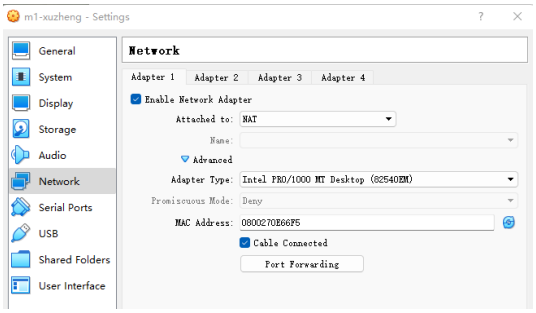
Arrancamos e introducimos nuestros datos dejando que nos instale SSH:

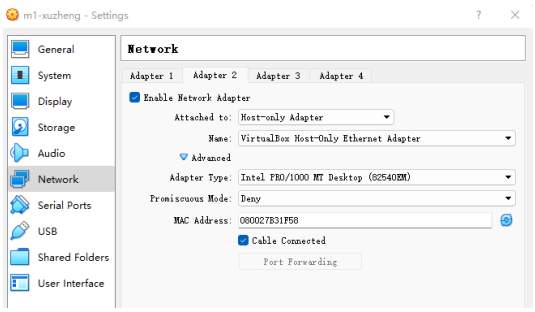




2. Configuración de red

Una vez instalado la máquina virtual, vamos a configurar la red para permitir la conexión con Internet y con el anfitrión. En primer lugar activamos los adaptadores NAT y solo-anfitrión:





Podemos usar el comando **ipconfig** en el anfitrión para ver la puerta de enlace (esta red ya estaba creada anteriormente por las prácticas de ISE):

```
Ethernet adapter VirtualBox Host-only Ethernet Adapter:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::5102:65b5:c7bf:ab1c%7
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :
```

2.1. Configuración de adaptadores mediante netplan

Configuramos la red con **netplan** editando el archivo */etc/netplan/config.yaml*:

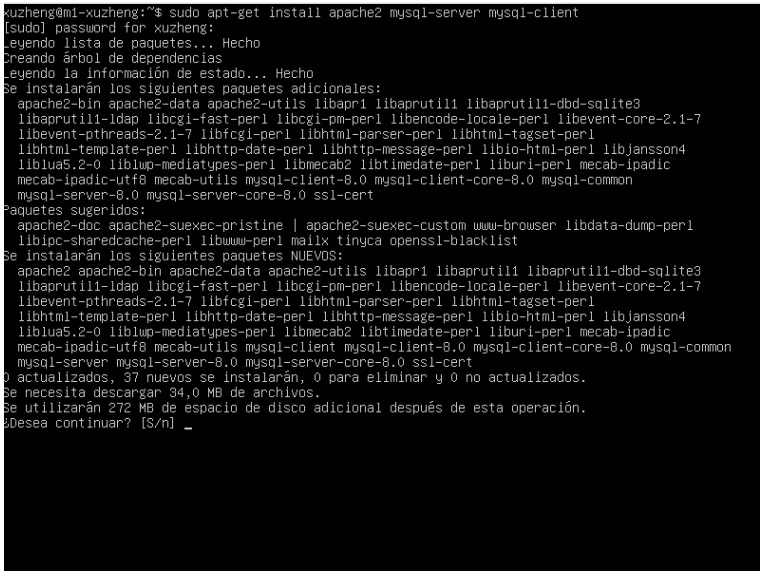
```
network:
        ethernets:
                enp0s3:
                        dhcp4: true
                enp0s8:
                        dhcp4: false
                        addresses: [192.168.56.70/24]
        version: 2
~
~
```

Dejamos una interfaz que se configura mediante DHCP y otra con IP estática **192.168.56.70**. Aplicamos los cambios con **netplan apply** y comprobamos con **ifconfig**:

```
xuzheng@m1-xuzheng:~$ sudo netplan apply
xuzheng@m1-xuzheng:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
        inet6 fe80::a00:27ff:fe0e:66f5  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:0e:66:f5  txqueuelen 1000  (Ethernet)
        RX packets 525  bytes 493819 (493.8 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 278  bytes 30565 (30.5 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.56.70  netmask 255.255.255.0  broadcast 192.168.56.255
        inet6 fe80::a00:27ff:feb3:1f58  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:b3:1f:58  txqueuelen 1000  (Ethernet)
        RX packets 1616  bytes 492635 (492.6 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 29  bytes 2306 (2.3 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 186  bytes 16614 (16.6 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 186  bytes 16614 (16.6 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

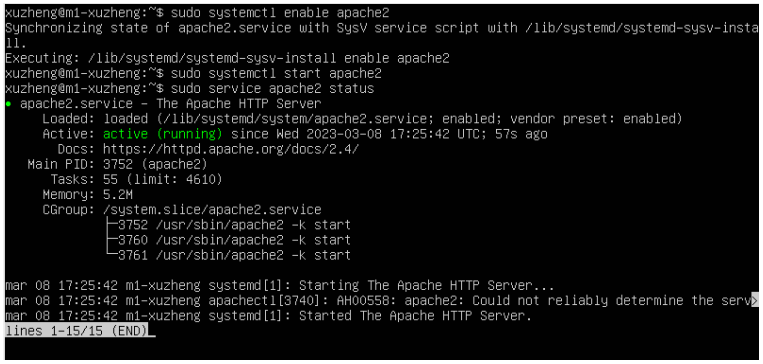
3. Instalación y configuración de Apache+PHP+MySQL

Sigamos con la configuración de la máquina virtual instalando Apache, PHP y MySQL:

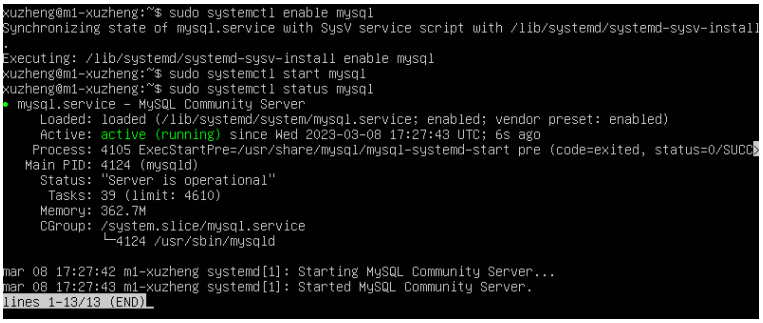


Una vez finalizada la instalación comprobamos:

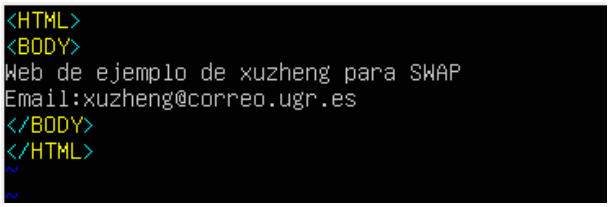
Podemos ver que el servidor está inactivo, lo activamos:



De mismo modo con MySQL:

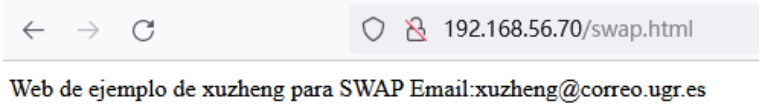


Para comprobar el funcionamiento de Apache creamos el archivo *swap.html* en el directorio */var/www/html/*:



En la versión de Ubuntu Server instalado, **cURL** ya está instalado de por defecto, podemos utilizarlo para acceder al archivo html creado anteriormente:

También es posible acceder desde el anfitrión:



3.1. Cambio de puerto

Para cambiar el puerto del servidor Apache modificamos los archivos */etc/apache2/ports.conf* y */etc/apache2/sites-enabled/000-default.conf*, en este caso, cambiamos de 80 a 8080:

```
# If you just change the port or add more ports here, you will likely also
# have to change the VirtualHost statement in
# /etc/apache2/sites-enabled/000-default.conf

#Listen 80
Listen 8080

<IfModule ssl_module>
        Listen 443
</IfModule>

<IfModule mod_gnutls.c>
        Listen 443
</IfModule>
```

```
<VirtualHost *:8080>
        # The ServerName directive sets the request scheme, hostname and port that
        # the server uses to identify itself. This is used when creating
        # redirection URLs. In the context of virtual hosts, the ServerName
        # specifies what hostname must appear in the request's Host: header to
        # match this virtual host. For the default virtual host (this file) this
        # value is not decisive as it is used as a last resort host regardless.
        # However, you must set it for any further virtual host explicitly.
        #ServerName www.example.com

        ServerAdmin webmaster@localhost
        DocumentRoot /var/www/html

        # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
        # error, crit, alert, emerg.
        # It is also possible to configure the loglevel for particular
        # modules, e.g.
        #LogLevel info ssl:warn

        ErrorLog ${APACHE_LOG_DIR}/error.log
        CustomLog ${APACHE_LOG_DIR}/access.log combined

        # For most configuration files from conf-available/, which are
        # enabled or disabled at a global level, it is possible to
        # include a line for only one particular virtual host. For example the
        # following line enables the CGI configuration for this host only
        # after it has been globally disabled with "a2disconf".
        #Include conf-available/serve-cgi-bin.conf
</VirtualHost>

# vim: syntax=apache ts=4 sw=4 sts=4 sr noet
```

Reiniciamos el servicio de Apache y comprobamos:

```
xuzheng@m1-xuzheng:~$ curl http://192.168.56.70/swap.html
curl: (7) Failed to connect to 192.168.56.70 port 80: Connection refused
xuzheng@m1-xuzheng:~$ curl http://192.168.56.70:8080/swap.html
<HTML>
<BODY>
Web de ejemplo de xuzheng para SWAP
Email:xuzheng@correo.ugr.es
</BODY>
</HTML>
xuzheng@m1-xuzheng:~$
```

3.2. Directorio virtual

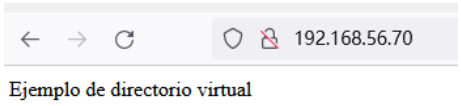
Comenzamos creando un directorio */var/www/ejemplo/public_html* y un archivo *index.html* sencillo:

```
<HTML>
<BODY>
Ejemplo de directorio virtual
</BODY>
</HTML>
```

Para evitar problemas de privilegios, ejecutamos **sudo chown -R www-data: /var/www/ejemplo**. Ahora necesitamos crear el archivo de configuración */etc/apache2/sites-available/ejemplo.conf* como sigue:

```
<VirtualHost *:80>
        # The ServerName directive sets the request scheme, hostname and port that
        # the server uses to identify itself. This is used when creating
        # redirection URLs. In the context of virtual hosts, the ServerName
        # specifies what hostname must appear in the request's Host: header to
        # match this virtual host. For the default virtual host (this file) this
        # value is not decisive as it is used as a last resort host regardless.
        # However, you must set it for any further virtual host explicitly.

        ServerName ejemplo
        ServerAlias ejemplo

        ServerAdmin webmaster@localhost
        DocumentRoot /var/www/ejemplo/public_html

        # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
        # error, crit, alert, emerg.
        # It is also possible to configure the loglevel for particular
        # modules, e.g.
        #LogLevel info ssl:warn

        <Directory /var/www/ejemplo/public_html>
                Options -Indexes +FollowSymLinks
                AllowOverride All
        </Directory>


        ErrorLog ${APACHE_LOG_DIR}/error.log
        CustomLog ${APACHE_LOG_DIR}/access.log combined

        # For most configuration files from conf-available/, which are
        # enabled or disabled at a global level, it is possible to
        # include a line for only one particular virtual host. For example the
        # following line enables the CGI configuration for this host only
        # after it has been globally disabled with "a2disconf".
        #Include conf-available/serve-cgi-bin.conf
```

Activamos el directorio virtual con **sudo a2ensite ejemplo**, volvemos a habilitar el puerto 80 en */etc/apache2/ports.conf* y reiniciamos Apache. Para comprobar podemos acceder desde el anfitrión:

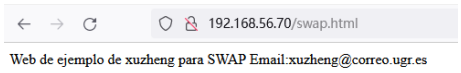


3.3. Redirección de puertos

Vamos redirigir el puerto 80 del directorio virtual al puerto 8080, para ello añadimos a */etc/apache2/sites-available/ejemplo.conf* las siguientes líneas:

```
ProxyPreserveHost On
ProxyRequests Off
ProxyPass / http://localhost:8080/
ProxyPassReverse / http://localhost:8080/
```

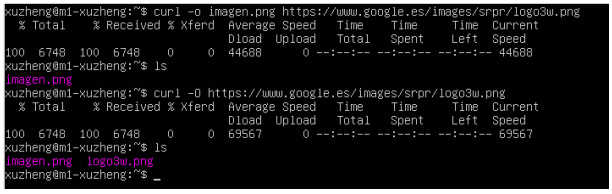
Además, tenemos que ejecutar **sudo a2enmod proxy && sudo a2enmod proxy_http** para activar módulos necesarios y reiniciamos Apache. Para comprobarlo, accedemos desde el anfitrión:



4. Instalación y configuración de cURL

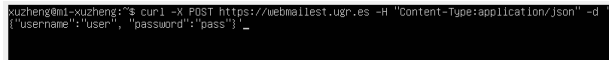
Como habíamos mencionado anteriormente, **cURL** ya está instalado. Podemos comprobarlo con **curl —version**:

Podemos usarlo con argumento **-o** indicando el nombre del archivo que deseamos que se guarde o con argumento **-O** para descargar con el nombre original:



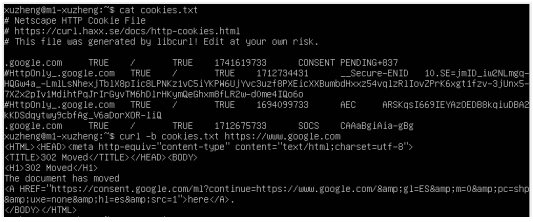
4.1. Peticiones Get/Post

Por defecto, las peticiones que realizan **cURL** son de tipo GET, pero podemos usar cualquier método de petición mediante el argumento **-X** indicando el tipo. Como ejemplo vamos a realizar una petición POST al correo institucional:



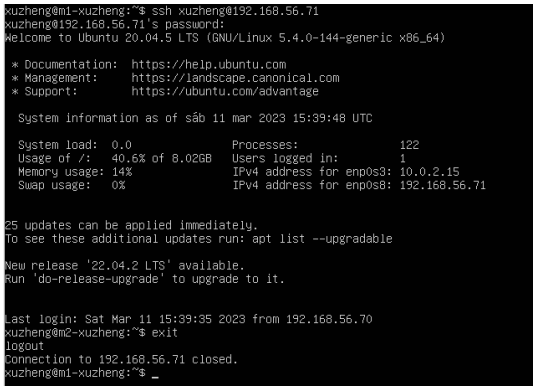
4.2. Cookies

cURL permite descargar cookies de sitios web mediante el argumento **-c**. También permite el envío de los mismos mediante el argumento **-b**:



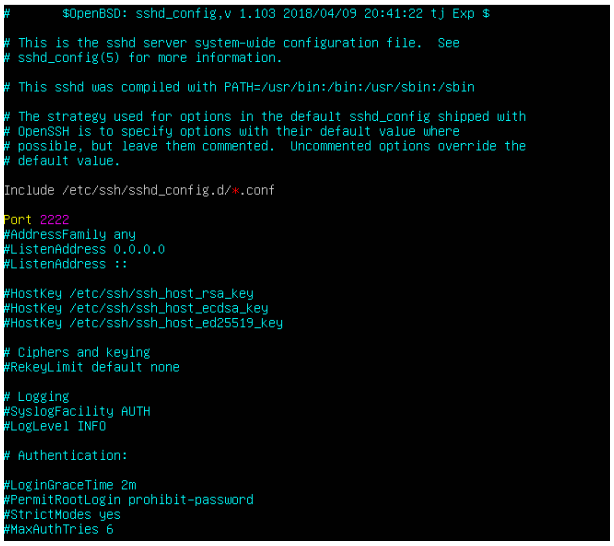
5. Configuración de SSH

Recordemos que ya habíamos instalado SSH, para ver que funciona correctamente vamos a intentar conectar ambas máquinas:

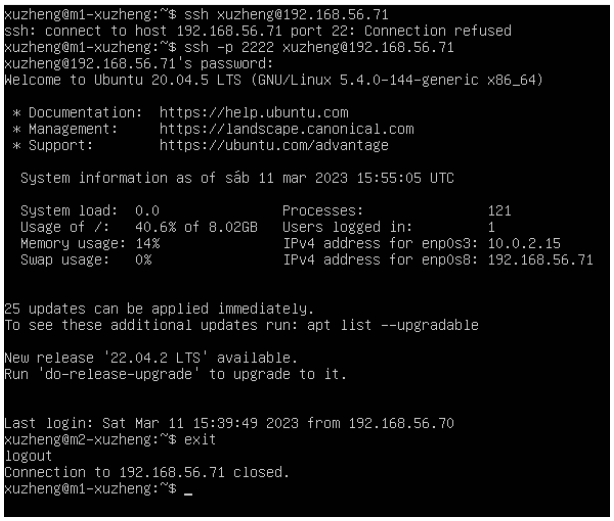


5.1. Cambio de puerto

Para cambiar el puerto donde se conecta SSH, necesitamos configurar el archivo */etc/ssh/sshd_config*. En este caso, usaremos el puerto 2222 en ambas máquinas:



Después de guardar los cambios tenemos que reiniciar el servicio SSH. Una vez reiniciado, para conectarnos hace falta especificar el puerto mediante el argumento **-p**:



5.2. Conexión sin contraseña

En primer lugar, necesitamos generar el par de claves pública y privada. Lo hacemos con el comando **ssh-keygen** dejando los campos vacíos como sigue:

```
xuzheng@m1-xuzheng:~$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/xuzheng/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/xuzheng/.ssh/id_rsa
Your public key has been saved in /home/xuzheng/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:QUg82Sd5oWxnzCmPWEo/oWK3+kbJ7jbyOnKiqfX+LEY xuzheng@m1-xuzheng
The key's randomart image is:
+---[RSA 3072]----+
|     o.o=.o.     |
|      ++.*..     |
|      ..O.*      |
|     . B O       |
|    o.=.S .      |
|   .Eo+. .       |
|  .. +.          |
| . oBoB          |
|..o++#*.         |
+----[SHA256]-----+
xuzheng@m1-xuzheng:~$
```

Una vez creadas en ambas máquinas copiamos la clave pública a la máquina contraria:

```
xuzheng@m1-xuzheng:~$ ssh-copy-id -p 2222 xuzheng@192.168.56.71
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/xuzheng/.ssh/id_rsa.pub"
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are alr
eady installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to inst
all the new keys
xuzheng@192.168.56.71's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh -p '2222' 'xuzheng@192.168.56.71'"
and check to make sure that only the key(s) you wanted were added.

xuzheng@m1-xuzheng:~$ _
```

```
xuzheng@m2-xuzheng:~$ ssh-copy-id -p 2222 xuzheng@192.168.56.70
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/xuzheng/.ssh/id_rsa.pub"
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are alr
eady installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to inst
all the new keys
xuzheng@192.168.56.70's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh -p '2222' 'xuzheng@192.168.56.70'"
and check to make sure that only the key(s) you wanted were added.

xuzheng@m2-xuzheng:~$ _
```

Ahora al intentar conectar ya no nos pide la contraseña:

```
xuzheng@m1-xuzheng:~$ ssh -p 2222 xuzheng@192.168.56.71
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.4.0-144-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of sáb 11 mar 2023 16:14:51 UTC

  System load:  0.02              Processes:               121
  Usage of /:   40.7% of 8.02GB   Users logged in:         1
  Memory usage: 14%               IPv4 address for enp0s3: 10.0.2.15
  Swap usage:   0%                IPv4 address for enp0s8: 192.168.56.71


25 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

New release '22.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


Last login: Sat Mar 11 16:14:20 2023 from 192.168.56.70
xuzheng@m2-xuzheng:~$ exit
logout
Connection to 192.168.56.71 closed.
```

```
xuzheng@m2-xuzheng:~$ ssh -p 2222 xuzheng@192.168.56.70
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.4.0-144-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of sáb 11 mar 2023 16:15:01 UTC

  System load:  0.03              Processes:               122
  Usage of /:   40.6% of 8.02GB   Users logged in:         1
  Memory usage: 14%               IPv4 address for enp0s3: 10.0.2.15
  Swap usage:   0%                IPv4 address for enp0s8: 192.168.56.70


25 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

New release '22.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


Last login: Sat Mar 11 15:55:57 2023 from 192.168.56.71
xuzheng@m1-xuzheng:~$ exit
logout
Connection to 192.168.56.70 closed.
```

6. Bibliografía

- https://ubiq.co/tech-blog/how-to-change-port-number-in-apache-in-ubuntu/
- https://elpuig.xeill.net/Members/vcarceler/articulos/configuracion-basica-en-ubuntu-20-04-server
- https://linuxize.com/post/how-to-set-up-apache-virtual-hosts-on-ubuntu-18-04/?utm_content=cmp-true
- https://reqbin.com/req/c-g5d14cew/curl-post-example
- https://curl.se/docs/manpage.html
- https://www.ionos.com/help/server-cloud-infrastructure/getting-started/important-security-information-for-your-server/changing-the-default-ssh-port/
- https://www.ibm.com/support/pages/configuring-ssh-login-without-password